APPENDIX H GROUNDWATER SAMPLING

[NOTE: ADEQ and UST stakeholders will be revising this appendix to insure that the regulated public is provided appropriate guidance regarding the issue of groundwater sampling.]

The following guidelines should be followed when sampling groundwater:

- To prevent the occurrence of cross-contamination, sampling equipment should be properly decontaminated in accordance with ASTM D 5088-90 (*Practice for Decontamination of Field Equipment Used at Nonradioactive Waste Sites*).

- Newly installed monitor wells, which are properly constructed and developed, should be purged .

- Subsequent to well development, the need for monitor well purging is dependent upon **the data quality objectives** of the phase of work conducted, *i.e.*, investigation, remediation or compliance determination.

- Purging monitor wells prior to sampling is not necessary under the following conditions:
  - **S** During investigation when COCs are greater than the potentially applicable remediation levels; and
  - **S** During remediation when groundwater samples are collected for the purpose of monitoring the progress of the remediation.

- If during investigation or remediation of COCs it is determined that site-specific conditions warrant the purging of the monitor well prior to sample collection please provide the justification why the purging is appropriate.

- Purging monitor wells prior to sampling is necessary when groundwater samples are collected to demonstrate compliance at or below the applicable AWQS, and that the site is eligible for LUST case closure. Purging and sampling minimizes errors that may result in under-reporting of volatile and semi-volatile COC levels, and over-reporting of inorganic and sorbed phase COCs.

- If purging of monitor wells is appropriate, then the method of purging should result in groundwater samples which are representative of actual aquifer conditions. When determining the appropriate method of purging, the type of COC involved and the site-specific hydrologic conditions should be considered. ADEQ recommends that purging result in steady state groundwater conditions and demonstrated by obtaining stabilized values (± five to ten percent variation in measured results) for conductivity, dissolved

oxygen, and pH. Typically, for a 2-inch PVC 0.1-slotted screen, low flow rates (less than or equal to 100 milliliters per minute) are recommended. For other wells, flow rates would incrementally increase with bore diameter. When using a pump, the volume of the tubing and pump must be evacuated prior to sample collection.

- The sampling methodology should be consistent for a site (for all monitor wells and between monitor events). If a well is purged, sampling should be collected from the pump used to purge the well.

- The use of bailers is not recommended for compliance well purging or sampling of groundwater when COCs are volatile or semi-volatile compounds, or when COCs are adsorbed to finely suspended particulates prominent in the groundwater sample. However, bailers may be useful in conditions of low yield monitor wells for which the lowest practical pumping rate can not achieve hydraulic stabilization, or during investigation and remediation phases when levels of COCs are relatively higher than the investigative level and corrective action standard, respectively.

- Samples to be analyzed for BTEX or VOCs should be collected in 40 ml vials with a Teflon-sided septa, be slowly filled so that air-bubbles and turbulence are minimized, preserved with hydrochloric acid, and immediately stored on ice. Samples intended for shipping should be placed in a sealable plastic bag and transferred to blue ice, i.e., sealed artificial coolant.

- The required analyses and the acceptable analytical methods are described in Sections 4 and 6.

- The UST Program requests that groundwater samples be obtained no earlier than one week after development of a well. This waiting period allows the aquifer to stabilize, and any contaminant introduced during well construction activities to dilute. A longer waiting period may be warranted for low permeability formations.

- Normally, groundwater samples should be collected from as close to the top of the water table as possible when sampling for LNAPLs. However, collection locations of groundwater samples should account for chemical-physical characteristics of the target COCs and site-specific hydrologic conditions which affects the COC distribution within the aquifer.

- Normally, groundwater samples should not be collected from wells that have their screened interval submerged. If monitor wells with submerged screened intervals are sampled please provide the justification why the sampling is appropriate.